

Amendments to the Claims

This listing of claims will replace all prior listings of claims in the application.

Listing of Claims

1. (Currently Amended) A process for capturing and recovering carbon dioxide and sulphur dioxide from the combustion of a carbonaceous fuel having a high carbon content, a relatively high sulphur content and a low ash content, which process comprises:

(a) splitting a flow of carbonaceous fuel having a particle size compatible with combustion in a ~~fluidised~~fluidized bed into a major proportion and a minor proportion;

(b) transferring the major proportion of the fuel to a ~~pressurised fluidised~~pressurized fluidized bed combustor and carbonator ~~(PFBC/C)~~, PFBC/C;

(c) combusting the major proportion of the fuel flow in the PFBC/C in the presence of air and in the presence of calcium oxide;

(d) recovering a flue gas flow containing solids including calcium carbonate and calcium sulphate from the PFBC/C;

(e) separating the solids from the flue gas flow;

(f) transferring the minor proportion of the fuel to a calciner;

(g) combusting the minor proportion of the flow of fuel in the calciner in the presence of both relatively pure oxygen and the solids flow separated in step (e) to convert the calcium carbonate in the solids flow into calcium oxide and carbon dioxide gas;

(h) discharging and recovering a flow consisting essentially of carbon dioxide gas from the calciner;

(i) recovering a flow of solids from the calciner including the calcium oxide generated in the calciner;

(j) transferring the flow of solids obtained in step ~~(1)~~(i) to the PFBC/C to provide the calcium oxide required in step (c); and

(k) recovering calcium sulphate and spent solids from the solids flowing through the PFBC/C and adding fresh calcium carbonate to the calciner to maintain a solids balance within the process.

2. (Original) A process according to Claim 1 wherein the carbon content of the fuel is less than about 85% by weight.

3. (Original) A process according to Claim 2 wherein the carbon content of the fuel is from about 80% to about 85% by weight.

4. (Original) A process according to Claim 3 wherein the carbon content of the fuel is about 83% by weight.

5. (Original) A process according to Claim 1 wherein the carbonaceous fuel is chosen from the group consisting of petroleum coke, anthracite, coal and natural gas.

6. (Original) A process according to claim 5 wherein the carbonaceous fuel is petroleum coke.

7. (Original) A process according to Claim 1 wherein the carbonaceous fuel has an ash content of less than about 3%.

8. (Original) A process according to Claim 7 wherein the carbonaceous fuel has an ash content of less than 1% by weight.

9. (Original) A process according to claim 1 wherein the PFBC/C and the calciner are both operated at the same pressure.

10. (Original) A process according to Claim 1 wherein the PFBC/C is operated under pressure and the calciner is operated at ambient pressure.

11. (Original) A process according to Claim 1 wherein the PFBC/C and the calciner are both operated at a pressure of from about 15 bar to about 20 bar.

12. (Original) A process according to Claim 1 wherein the PFBC/C is operated at a pressure of from about 15 bar to about 20 bar and the calciner is operated at ambient pressure.

13. (Original) A process according to Claim 1 wherein the sulphur content of the fuel is less than about 10% by weight.

14. (Original) A process according to Claim 13 wherein the sulphur content of the fuel is from about 3% to about 6% by weight.

15. (Original) A process according to Claim 14 wherein the sulphur content of the fuel is about 4% by weight.

16. (Original) A process according to Claim 1 wherein the weight ratio of fuel in the major and minor proportions is about 2:1.

17. (Currently Amended) An apparatus for capturing and recovering carbon dioxide and sulphur dioxide from the combustion of a carbonaceous fuel having a high carbon content, a relatively high sulphur content and a low ash content, which apparatus includes in combination:

(i) a carbonaceous fuel feed line for providing a flow of carbonaceous fuel of a size suitable for use in a ~~fluidised~~fluidized bed combustor;

(ii) a splitter ~~constructed and arranged to divide for~~ dividing the flow of fuel in the fuel feed line into a major proportion and into a minor proportion;

(iii) a combustor fuel feed line ~~constructed and arranged to receive for~~ receiving the major proportion of the fuel flow from the splitter;

(iv) a ~~pressurised fluidised~~pressurized fluidized bed combustor and carbonator ~~constructed and arranged to receive for~~ receiving and ~~combust~~combusting the major proportion of the fuel flow from the combustor fuel feed line;

(v) a compressed air line ~~constructed and arranged to provide for~~ providing combustion air to the PFBC/C;

(vi) a calcium oxide transfer line having a first end and a second end, the first end ~~being constructed and arranged to feed for~~ feeding a solids flow including calcium oxide to the PFBC/C;

(vii) a separator feed line ~~constructed and arranged to transfer for~~ transferring a flow of flue gas containing entrained solids including calcium carbonate from the PFBC/C to a separator ~~constructed and arranged to separate for~~ separating the flue gas from the entrained solids therein;

(viii) an exhaust flue ~~constructed and arranged to receive for~~ receiving the flue gas from the separator;

(ix) a calcium carbonate transfer line ~~constructed and arranged to receive for~~ receiving the entrained solids containing calcium carbonate from the separator;

(x) a calciner fuel feed line ~~constructed and arranged to receive for~~ receiving the minor proportion of the fuel flow from the splitter;

(xi) a calciner ~~constructed and arranged to receive for~~ receiving the minor proportion of the fuel flow in the calciner fuel feed line and calcium carbonate from the calcium carbonate transfer line in step (ix);

(xii) an oxygen feed line ~~constructed and arranged to provide~~for providing oxygen for combustion to the calciner;

(xiii) a carbon dioxide line ~~constructed and arranged to receive~~for receiving a flow consisting essentially of carbon dioxide from the calciner;

(xiv) the second end of the calcium oxide transfer line ~~being constructed and arranged to receive~~for receiving a solids flow containing calcium oxide from the calciner;

(xv) a means ~~to recover~~for recovering calcium sulphate and spent solids formed in the PFBC/C from the circulating solids; and

(xvi) a means ~~constructed and arranged to add~~for adding sufficient fresh calcium carbonate to the calciner to maintain the solids balance in the system.